EM-535 Series

5.25” Embedded SBC

with NS Geode™ CPU,

LCD/VGA,TV,Sound,LAN,SSD Socket,

PCMCIA/Compact Flash /GPS

COPYRIGHT©

This document is a copyright of the original manufacturer, 2000. The original manufacturer reserves the right to make improvements to the product(s) described in this manual at any time without notice. This manual may not, in whole or in part, be photocopied, reproduced, transcribed, translated, or transmitted in whatever form without the written consent of the manufacturer, except for copies retained by the purchaser for backup purposes. All rights are reserved.

TRADEMARKS

Geode™ is a registered trademark of NS Corporation.

The following are trademarks or registered trademarks of their respective companies: IBM, Intel, AMD, Cyrix,NS, Award, AMI, Microsoft, Windows, Windows NT, Novell, SCO, PC/104, PICMG, ALI, UMC, SMC, Winbond. Products mentioned in this manual are mentioned for identification purposes only. All names of products or services appearing in this manual are the trademarks or registered trademarks of their respective organizations and companies.

Copyright 2000

Ver. No. V1.0
LEI-UM-EM535-000
Date : 2000/05/06

TABLE OF CONTENTS

CHAPTER	**1**	**INTRODUCTION**	**1**
	1.1	SPECIFICATION	2
	1.2	PACKING CHECK LIST	3
CHAPTER	**2**	**JUMPER SETTINGS AND CONNECTORS**	**4**
	2.1	BOARD OUTLINE OF EM-535	4
	2.2	JUMPER SETTING OVERVIEW	6
	2.3	INSTALLING THE DIMM MODULE	6
	2.4	JUMPER LOCATION FOR EM-535	7
	2.5	JUMPER SETTINGS SUMMARY FOR EM-535	8
	2.6	JUMPER SETTINGS FOR EM-535	9
	2.7	I/O CONNECTORS LOCATION FOR EM-535	13
	2.8	I/O CONNECTORS SUMMARY FOR EM-535	15
	2.9	I/O CONNECTORS DESCRIPTION	16
CHAPTER	**3**	**AWARD BIOS SETUP**	**30**
	3.1	RUNNING AWARD BIOS	30
	3.2	CMOS SETUP UTILITY	31
	3.3	STANDARD CMOS SETUP	32
	3.4	BIOS FEATURES SETUP	35
	3.5	CHIPSET FEATURES SETUP	38
	3.6	POWER MANAGEMENT SETUP	39
	3.7	PNP/PCI CONFIGURATION	41
	3.8	LOAD BIOS DEFAULTS	43
	3.9	LOAD SETUP DEFAULTS	43
	3.10	INTEGRATED PERIPHERALS	44
	3.11	SUPERVISOR / USER PASSWORD	46
	3.12	IDE HDD AUTO DETECTION	46
	3.13	Save & Exit Setup	47
	3.14	EXIT WITHOUT SAVING	47

TABLE OF CONTENTS

CHAPTER 4 BIOS UPDATED 48

4.1 BIOS UPDATED 48

4.2 AWARD BIOS FLASH INSTRUCTIONS 48

CHAPTER 5 DRIVERS SUPPORT 50

5.1 USE YOUR DRIVER CD-ROM 50

5.2 FILE DIRECTORY 50

APPENDIX A HOW TO USE WATCH-DOG TIMER 51

APPENDIX B TECHNICAL REFERENCE 52

GLOSSARY 54

TERMS AND CONDITIONS

RMA SERVICE REQUEST FORM

CHAPTER 1.

INTRODUCTION

The new EM-535 NS Geode™ GXm embedded SBC is a great choice for any multimedia applications. The NS Geode™ processor and its companion CX5530 chipset support up to 256MB memory and provide full functionality and performance to meet your needs.

EM-535 features Flat Panel/CRT display functions that support resolutions and color depths up to 1024x768 at 64K colors, TV-output for NTSC and PAL modes, and sound functions. And the Realtek 8139 chip provides PCI Fast Ethernet for network connectivity.

EM-535 has many expansion options, including one PCI expansion connector, one CompacatFlash socket, one PCMCIA socket and a socket for DiskOnChip 2000. Other on-board features include one PCI Enhanced IDE ports for up to four IDE and Ultra DMA-33 devices, four 16550 serial ports, two multi-mode parallel ports, two USB ports and one IrDA interface.

For any all-in-one boards like the EM535, most other similar products require customers to install many cables and adapters for various I/O's like VGA, USB, Audio, serial and parallel ports. That would cause messy and difficult tasks for users to implement on such a tiny and compact board area.

However, EM-535 does provide a great solution to save our customers from such headaches. With a pre-defined and pre-installed connector setup, it not only provides a very neat signal interface but also offers a vibration proof advantage. In turn, our customers will have a more solid foundation for their products and projects based upon EM-535.

1.1 SPECIFICATION

- Processor : NS Geode GXLV-200/233/266 MHz (on-board) CPU on-board
- Chipset : NS GX5530, Realtek RTL8139, Winbond W83977F / W83877TF I/O chipset, RICOH R5C476II PCMCIA Bridge, CHRONTEL CH7003B TV Encoder, AD1819A Audio CODEC
- System Memory / RAM : One DIMM socket, support up to 128MB of SDRAM
- VGA/LCD Controller : NS GX5530, shared memory 2MB, resolution up to 1024 x 768 @ 64K colors
- TV Output NTSC/PAL mode, support S-Video/Composite/R-G-B output
- Sound Output Built-in sound functions, include Mic-in/Line-in/Speaker-out
- Ethernet Controller : On board Realtek RTL8139, support 10/100 Base-T interface
- SSD interface : Reserved socket for DiskOnChip from M-System, support up to 144 MB flash memory disk
- GPS connector Reserved header for GPS kit
- PCMCIA Socket One PCMCIA socket, support Hot-plug function, Type-I/II
- CompactFlash Socket : One Compact Flash socket, support Hot-plug function, Type-I/II.
- Expansion Bus Built-in one PCI expansion slot
- IDE Interface : One PCI IDE port, support up to two IDE devices. Supports PIO mode 4 and Bus Master. Also supports Multi-word DMA and Ultra DMA/33.
- Floppy Drive Interface : One FDD port , support up to two floppy devices
- Serial Port : Four COM ports , Three RS-232 and one RS-232 / 422 / 485
- Parallel Port : Two Multi-mode parallel port (SPP/EPP/ECP)
- Keyboard/Mouse connector One 6-pin mini-DIM PS/2 keyboard/mouse connector on-board.
- Universal Serial Bus Support 2 USB ports
- IR Interface Supports one IrDA header
- Watchdog Timer Software 16 level time-out intervals (0/2/4/6/8/10/12/14/16/18/20/22/24/26/28/30 sec.)
- RTC : Internal RTC with Li battery
- BIOS : 256KB Award license BIOS
- Power management : I/O peripheral devices support power saving and doze/standby/suspend modes. APM 1.2 compliant.
- Power Connector : On-board ATX power connector, with one ATX/AT/HDD power connector optional
- Operating Temperature : 0℃ ~ 60℃
- Storage Temperature : -20℃ ~ 70℃
- Humidity : 5% ~ 95% RH, non-condensing
- Dimensions : 203 x 146 mm (8” x 5 3/4” inches) +/- 0.5mm
- Net weight : 350 g (0.770 pounds)
- EMI/EMS EN 50081-1/1994>EN 55022/1997>EN 61000-3-2/1995 >EN 61000-3-3/1995, EN 50082-1/1994>IEC 1000-4-2/1995, IEC 1000-4-3/1995, IEC 1000-4-4/1995

Ordering Information

Function / Model	VGA/LCD	SSD	GPS	Sound	LAN	TV	Compact Flash	PCMCIA	PCI
EM-535A	●	●	●	●	●	●	●	●	
EM-535B	●	●	●	●	●	●	●		
EM-535C	●	●	●	●	●	●			●
EM-535D	●	●	●	●	●				●
EM-535E	●	●	●	●					●
EM-535F	●	●	●						●

Note:

EM-535B/D/E/F are not standard products , if you want these please contact your supplier.

1.2 Packing Check List

Before you begin to install your card, please make sure that you received the following materials as listed below:

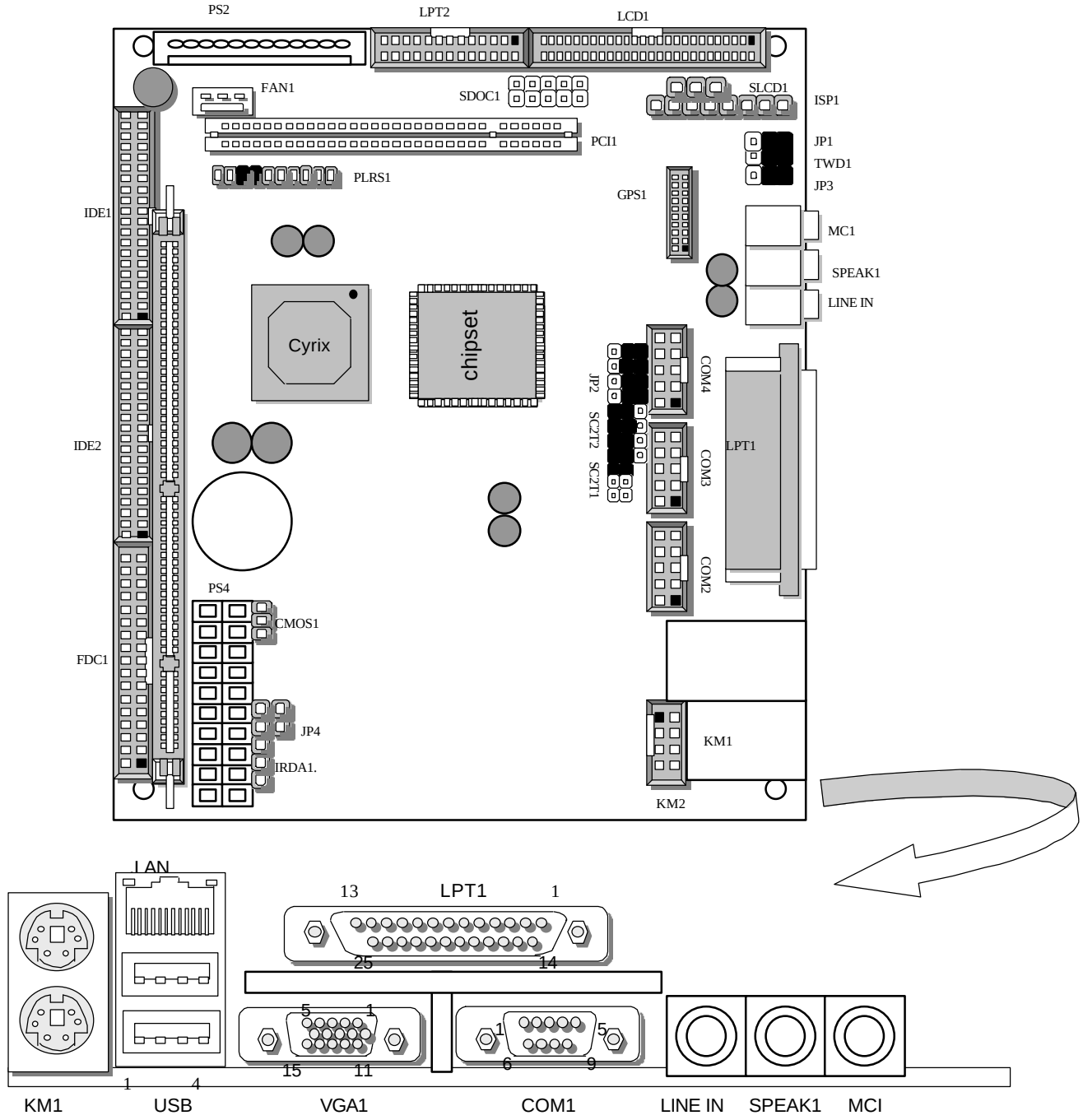
Item	*Qty*	*Remark*
EM-535	1 pc.	Embedded Single Board Computer
Keyboard / Mouse “Y” shape adapter cable	1 set	6 pin Min-Din to one 5 pin keyboard connector & one PS/2 mouse connector
Hard Disk Cable	1 pc.	40p to 40p standard header flat ribbon cable
FDD Cable	1 pc	34p to 34p standard header flat ribbon cable
COM port connector	1 pc	10 pin 2.54mm for 9 pin D-Sub, two COM port , 50cm
TV adapter cable	1 pc	6 pin Min-Din to one 4 pin female Min-Din & one RCA female connectors, (20cm)
CD-ROM	1 pc.	Drivers
User‘s manual	1 pc.	EM-535

CHAPTER 2.

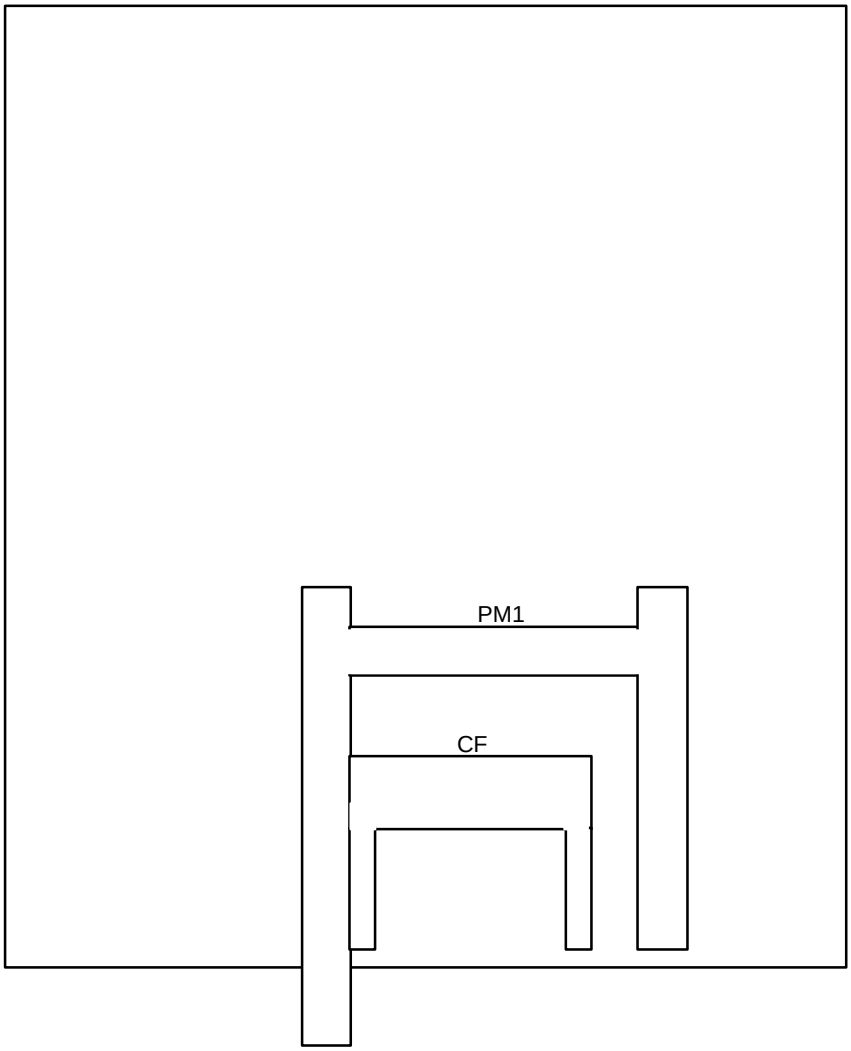
JUMPER SETTINGS AND CONNECTORS

The figure below shows the jumpers and connectors location on the EM-535:

2.1 BOARD OUTLINE OF EM-535

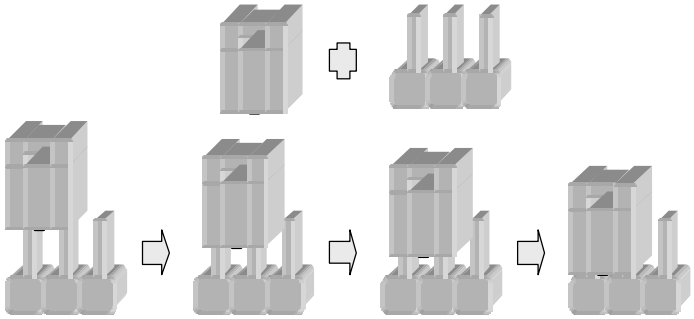


REAR SIDE



2.2 JUMPER SETTING OVERVIEW

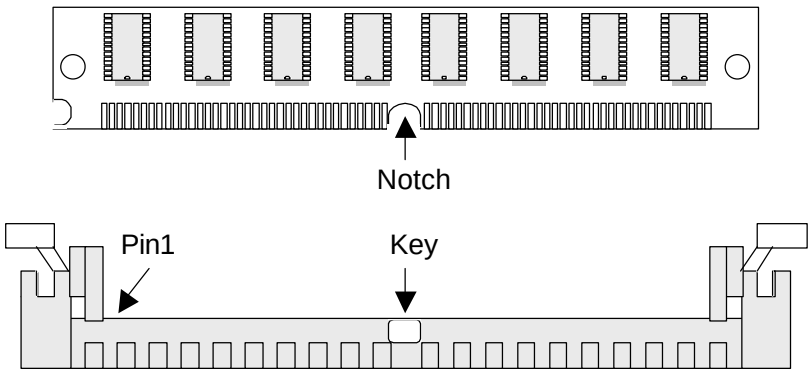
In order to select the operation modes of your system, configure and set the jumpers on the your SBC to match the need of your application. To set a jumper, a black plastic cap containing metal contacts is placed over the jumper pins as designated by the required configuration as listed in this section. A jumper is said to be " on " or " 1-2 " when the black cap has been placed on two of its pins, as show in the figure below:



A pair of needle-nose pliers is recommended when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local sales representative before you make any changes. In general, you simply need a standard cable to make most connections.

2.3 INSTALLING THE DIMM MODULE:

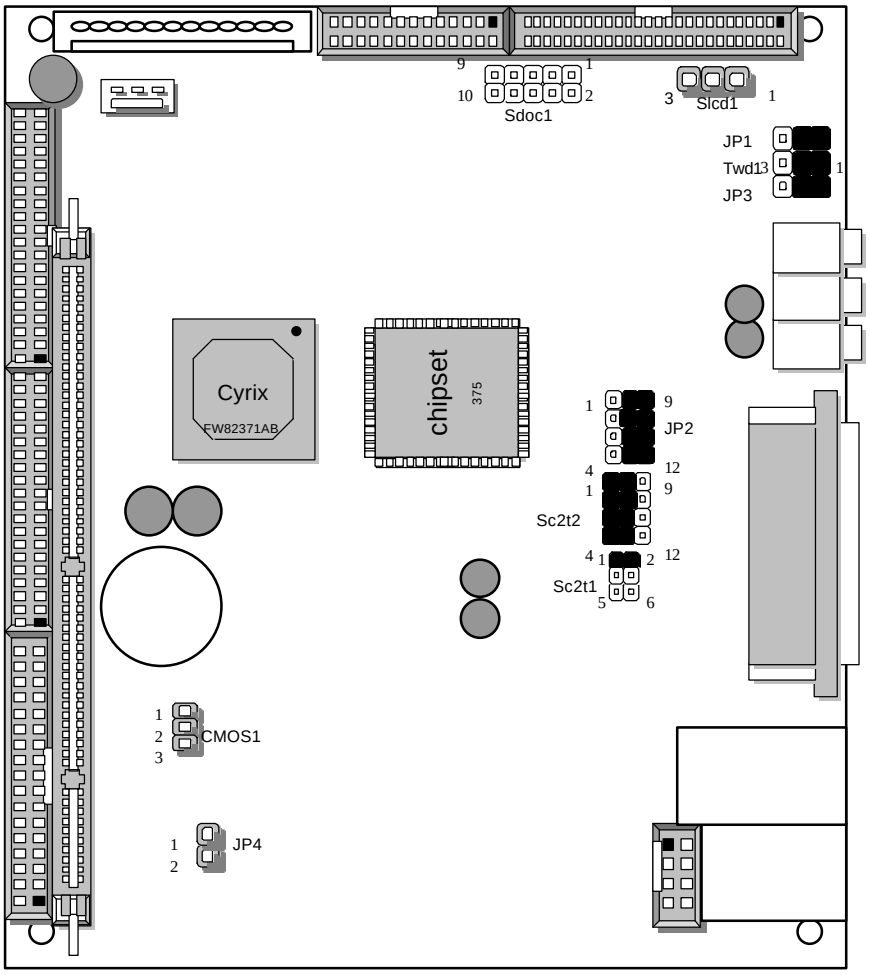
A DIMM module simply snaps into a socket on the system board. Pin1 of the DIMM module must correspond with Pin1 of the socket.



1.Position the DIMM above the socket with the "notch" in the module aligned with the "key" on the socket.

2. Seat the module at a 90 angle into the bank. Make sure it is completely seated. Tilt the module upright until it locks in place in the socket.

2.4 JUMPER LOCATION FOR EM-535



2.5 JUMPER SETTINGS SUMMARY FOR EM-535

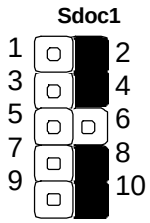
LOCATION	FUNCTION
Sdoc1	Select DiskOnChip(Flash Disk) Address
Slcd1	Select Panel Voltage
CMOS1	Clear CMOS Data
JP1	Default Setting
JP2	Select COM2 Enabled/ Disable
JP3	Default Setting
JP4	ATX Power sw pin Header
Twd1	Select Software Watch-Dog Timer
Sc2t1/Sc2t2	Select COM2 Type

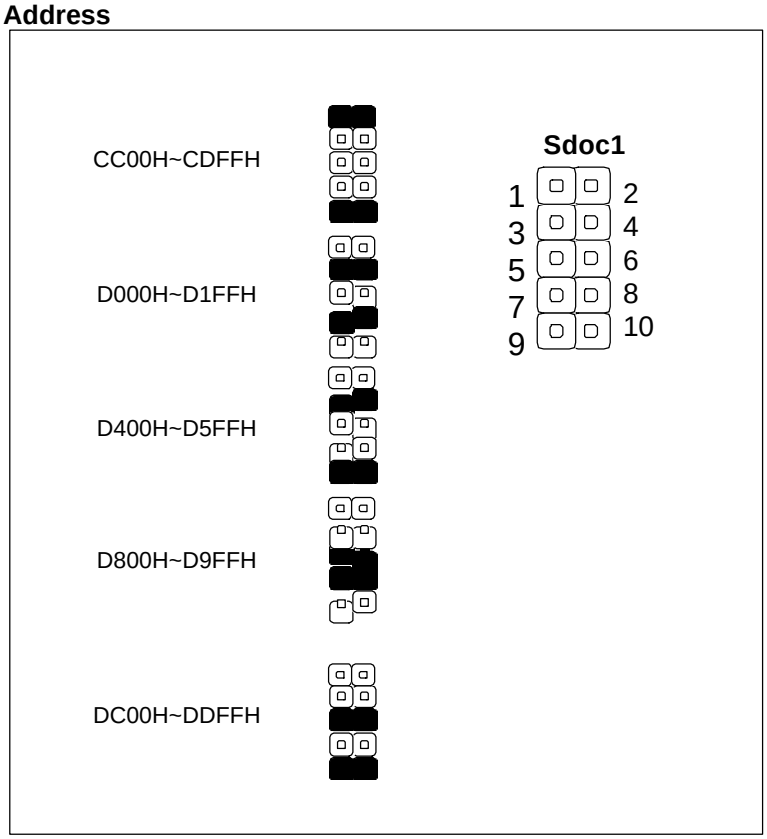
2.6 JUMPER SETTINGS OF EM-535

✦ **Sdoc1 : Select DiskOnChip (Flash Disk) Address**

Flash Disk Address	Sdoc1
CC00H~CDFFH	1-2,9-10
D000H~D1FFH	3-4,7-8
D400h~D5FFH	3-4,9-10
D800H~D9FFH	5-6,7-8
DC00H~DDFFH	5-6,9-10

Default :

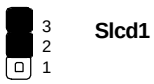


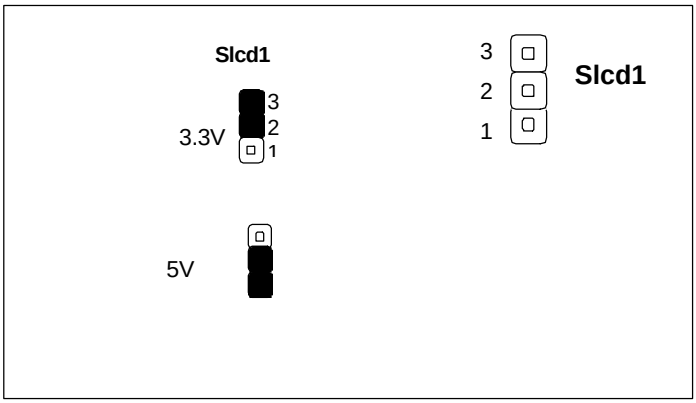


✦ **Slcd1 : Select Panel Voltage**

Panel Voltage	Vlcd1
3.3V (Default)	2-3
5V	1-2

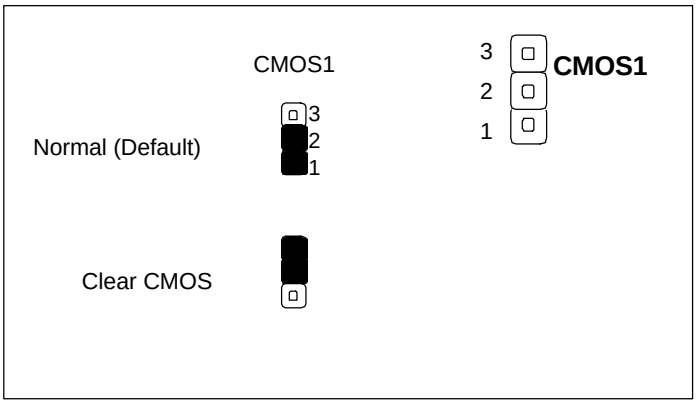
Default :





✦ **CMOS1 : Clear CMOS Data**

Description	**CMOS1**
Normal (Default)	1-2
Clear CMOS	2-3

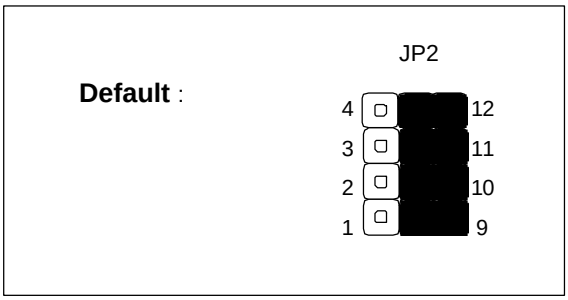


✦ **JP1 : Default Setting（1-2）**

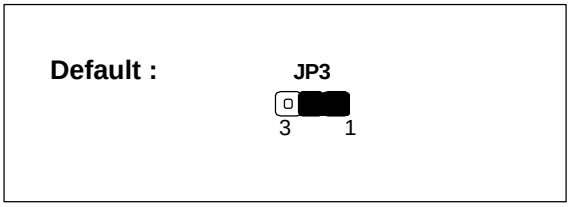
✦ **JP2：Select COM2 Enable / Disable**

COM2 Enable：（ 5-9, 6-10, 7-11, 8-12）≦ Default

COM2 Disable：（1-5, 2-6, 3-7, 4-8）≦ Use GPS



✦ **JP3：Default Setting（1-2）**



JP4：ATX Power Sw Pin Header

Default :

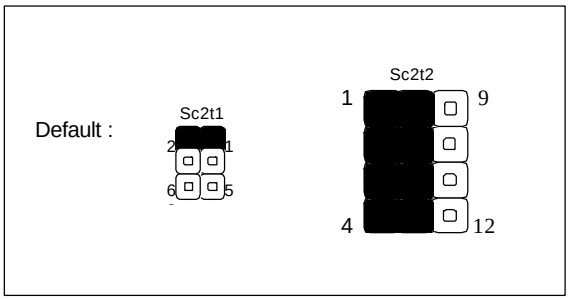
Twd1：Select Software Watch-Dog Timer

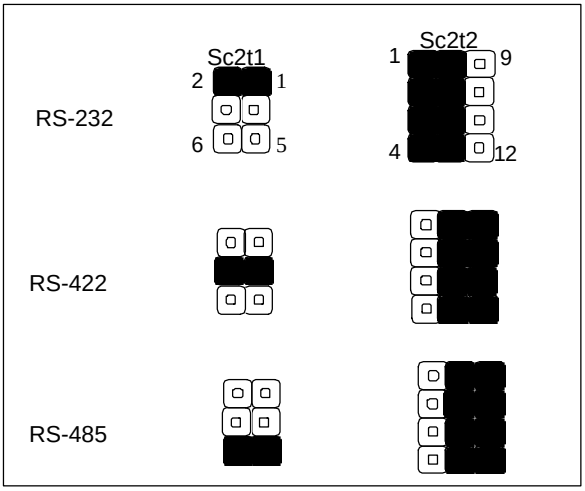
Software Watch-Dog Timer	Twd1
0/2/4/6/8/10/12/14/16/18/20/22/24/26/28/30	1-2
0/8/16/24/32/40/48/56/64/72/80/88/96/104/112/120	2-3

Default :

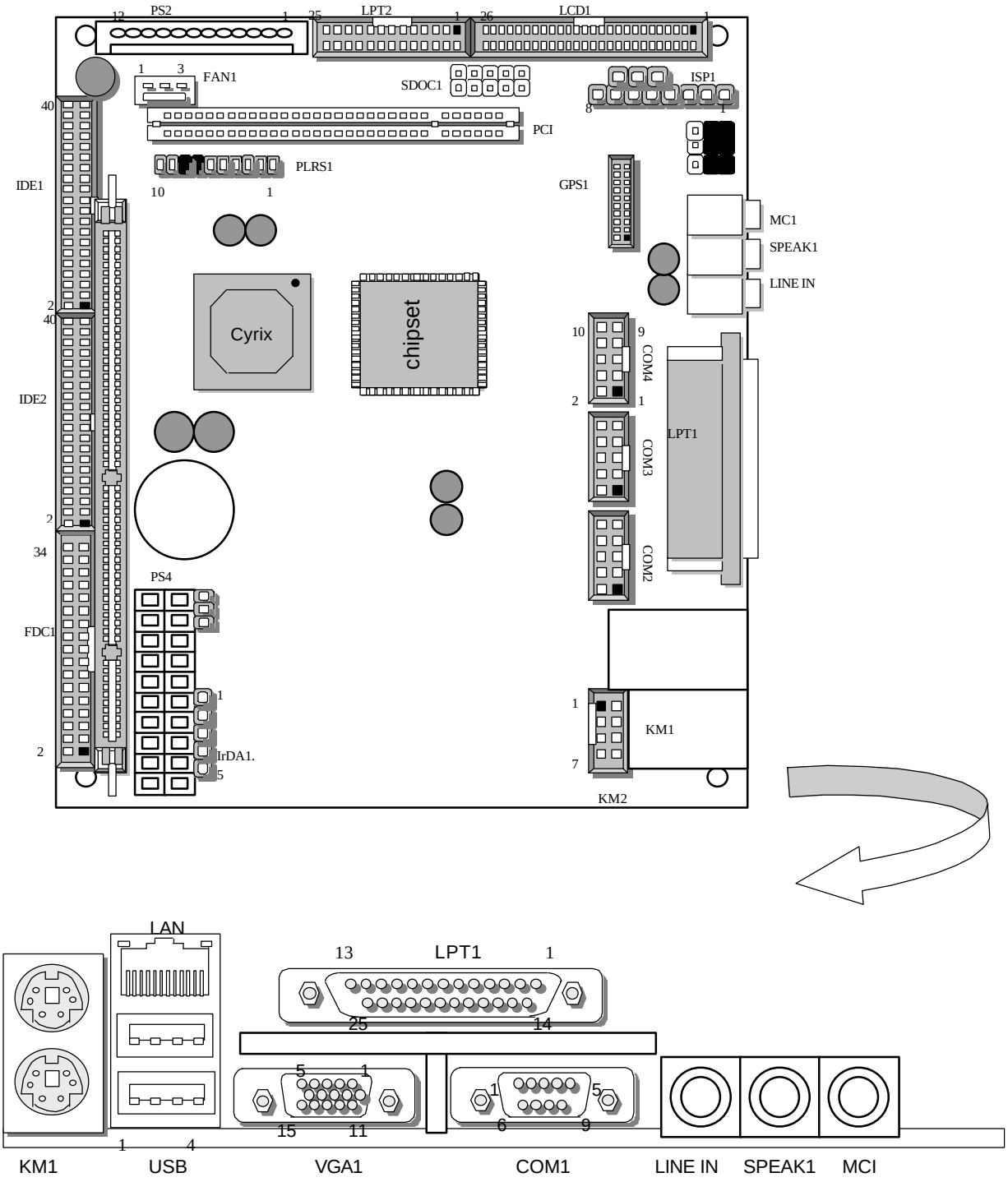
✦ **Sc2t1/Sc2t2 : Select COM2 Type**

COM2 Type	Sc2t1	Sc2t2
RS-232 (Default)	1-2	1-5,2-6,3-7,4-8
RS-422	3-4	5-9,6-10,7-11,8-12
RS-485	5-6	5-9,6-10,7-11,8-12

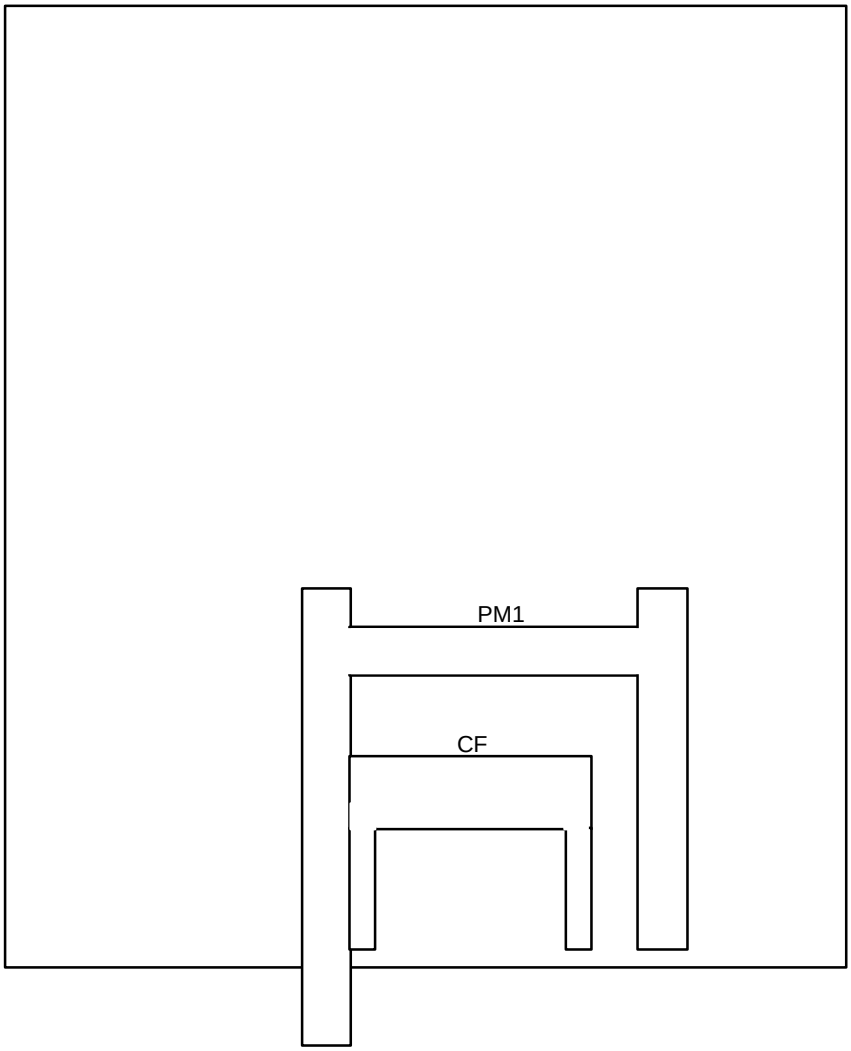




2.7 I/O CONNECTOR LOCATION FOR EM-535



REAR SIDE



2.8 I/O CONNECTOR SUMMARY OF EM-535

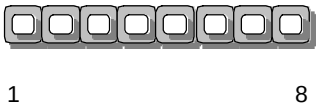
LOCATION	FUNCTION
ISP1	ISP GAL Connector(Factory only)
KM1	KB/Mouse/TV Connector(Dual Mini Din)
VGA1	VGA Connector
IDE1/IDE2	EIDE Connector (Header)
COM1	Serial Port #1 Connector (Header)
COM2	Serial Port #2 Connector (Header)
COM3/COM4	Serial Port #3/4 Connector (Header)
PS2	12 Pin Power Connector
IrDA1	Alternate IrDA
FAN1	FAN Connector
LPT1	Parallel Port Connector(D-Sub)
LPT2	Parallel Connector(Header)
FDC1	Floppy Interface Connector (Header)
LCD1	Panel LCD Connector(Header)
CF	COMPACT FLASH (Only for EM-535A)
PM1	PCMCIA SOCKET(Only for EM-535A)
GPS1	GPS Connector
KM2	KB/Mouse Connector(8 Pin Box Header)
PS4	ATX Power Connector
PLRS1	Power LED, Reset, Speaker Connector

2.9 I/O CONNECTORS DESCRIPTION

✦ **ISP1: ISP GAL Connector (Factory only)**

PIN NO.	DESCRIPTION
1	VCC
2	SDO
3	SDI
4	ISP
5	NC
6	MODE
7	Ground
8	SCLK

ISP 1

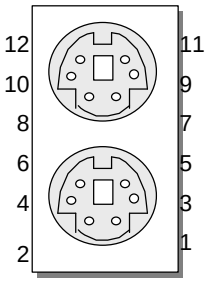


1 8

✦ **KM1：KB/Mouse/TV Connector（Dual Mini Din）**

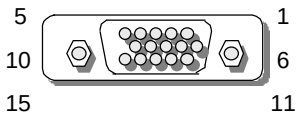
PIN NO.	DESCRIPTION
1	RGB SYNC
2	TV GND
3	TVG（C）（Green）
4	TV（Composite）（Blue）
5	RGBTV
6	TVR（Y）（Red）
7	PS/2 Keyboard Data
8	PS/2 Mouse Data
9	Ground
10	VCC
11	PS/2 Keyboard Clock
12	PS/2 Mouse Clock

KM1



✦ **VGA1 : VGA Connector**

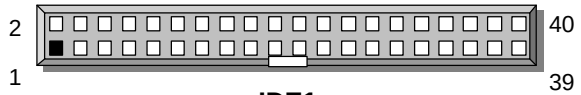
PIN NO.	DESCRIPTION
1	Red Color Signal
2	Green Color Signal
3	Blue Color Signal
4	NC
5	Ground
6	Ground
7	Ground
8	Ground
9	NC
10	Ground
11	NC
12	DDC-DATA
13	H-Sync.
14	V-Sync.
15	DDC-CLK



VGA1

✦ **IDE1/IDE2：EIDE Connector (Header)**

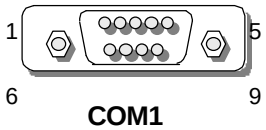
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Reset #	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	NC
21	DMA REQ	22	Ground
23	IOW #	24	Ground
25	IOR #	26	Ground
27	IOCHRDY	28	NC
29	DMA ACK #	30	Ground
31	Interrupt	32	IOCS16 #
33	SA1	34	NC
35	SA0	36	SA2
37	HDC CS0 #	38	HDC CS1 #
39	HDD Active LED #	40	Ground



IDE1

✦ **COM1 : RS-232 Serial Port #1 Connector (D-Sub)**

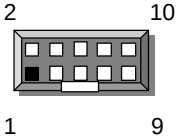
PIN NO.	DESCRIPTION
1	Data Carrier Detect (DCDA #)
2	Receive Data (RXDA)
3	Transmit Data (TXDA)
4	Data Terminal Ready (DTRA #)
5	Ground (GND)
6	Data Set Ready (DSRA #)
7	Request To Send (RTSA #)
8	Clear To Send (CTSA #)
9	Ring Indicator (RIA #)



COM1

✦ **COM2 : Serial Port #2 Connector (Header)**

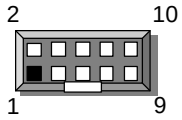
PIN NO.	DESCRIPTION		
	RS-232	RS-422	RS-485
1	Data Carrier Detect (DCDB #)	Transmit Data– (TXD-)	Data -
2	Data Set Ready (DSRB #)	NC	NC
3	Receive Data (RXDB)	Transmit Data+ (TXD+)	Data +
4	Request To Send (RTSB #)	NC	NC
5	Transmit Data (TXDB)	Receive Data+ (RXD+)	NC
6	Clear To Send (CTSB #)	NC	NC
7	Data Terminal Ready (DTRB #)	Receive Data- (RXD-)	NC
8	Ring Indicator (RIB #)	NC	NC
9	Ground	NC	NC
10	NC	NC	NC



COM2

✦ **COM3/COM4 : Serial Port #3/4 Connector (Header)**

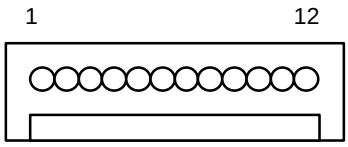
PIN NO.	DESCRIPTION
1	Data Carrier Detect (DCD #)
2	Data Set Ready (DSR #)
3	Receive Data (RXD)
4	Request To Send (RTS #)
5	Transmit Data (TXD)
6	Clear To Send (CTS #)
7	Data Terminal Ready (DTR #)
8	Ring Indicator (RI #)
9	Ground
10	NC



COM4

✦ **PS2: 12 Pin Power Connector**

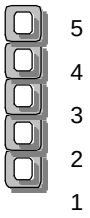
PIN NO.	DESCRIPTION
1	PWG
2	+5V
3	+12V
4	-12V
5	GND
6	GND
7	GND
8	GND
9	-5V
10	+5V
11	+5V
12	+5V



PS2

✦ **IrDA1 : Alternate IrDA**

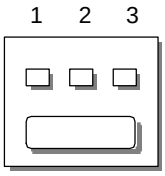
PIN NO.	DESCRIPTION
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX



IrDA1

✦ **FAN1 : FAN Connector**

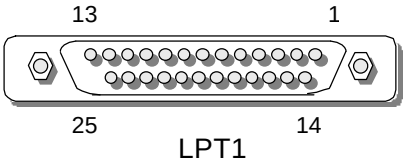
PIN NO.	DESCRIPTION
1	Ground
2	VCC
3	NC



FAN1

✦ **LPT1：Parallel Port Connector (D-Sub)**

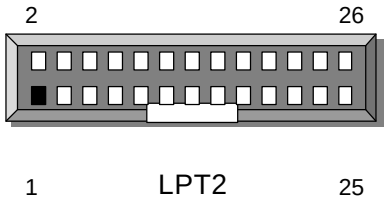
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Strobe #	14	Auto Form Feed
2	Data0	15	Error #
3	Data1	16	Initialize #
4	Data2	17	Printer Select IN #
5	Data3	18	Ground
6	Data4	19	Ground
7	Data5	20	Ground
8	Data6	21	Ground
9	Data7	22	Ground
10	Acknowledge #	23	Ground
11	Busy	24	Ground
12	Paper Empty	25	Ground
13	Printer Select		



LPT1

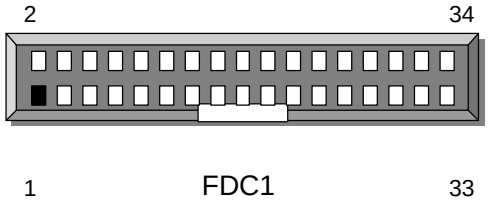
✦ **LPT2：Parallel Connector (Header)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Strobe #	2	Auto Form Feed
3	Data0	4	Error #
5	Data1	6	Initialize #
7	Data2	8	Printer Select IN #
9	Data3	10	Ground
11	Data4	12	Ground
13	Data5	14	Ground
15	Data6	16	Ground
17	Data7	18	Ground
19	Acknowledge #	20	Ground
21	Busy	22	Ground
23	Paper Empty	24	Ground
25	Printer Select	26	Ground



✦ **FDC1 : Floppy Interface Connector (Header)**

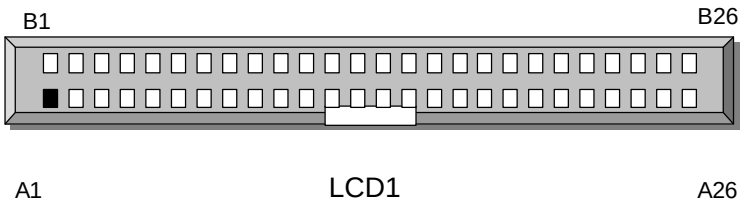
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Ground	2	Density Select
3	Ground	4	NC
5	Ground	6	DS1
7	Ground	8	Index #
9	Ground	10	Motor Enable A #
11	Ground	12	Drive Select B #
13	Ground	14	Drive Select A #
15	Ground	16	Motor Enable B #
17	Ground	18	Direction #
19	Ground	20	Step #
21	Ground	22	Write Data #
23	Ground	24	Write Gate #
25	Ground	26	Track 0 #
27	Ground	28	Write Protect #
29	NC	30	Read Data #
31	Ground	32	Head Side Select #
33	NC	34	Disk Change #



FDC1

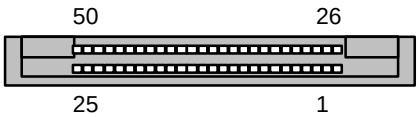
✦ **LCD1 : Panel LCD Connector (Header)**

PIN	SIGNAL	PIN	SIGNAL
A1	NC	B1	FD11
A2	NC	B2	NC
A3	FD0	B3	NC
A4	NC	B4	NC
A5	FD1	B5	FD12
A6	FD2	B6	NC
A7	NC	B7	GND
A8	GND	B8	SCLK
A9	FD3	B9	GND
A10	FD4	B10	DE
A11	NC	B11	FLM
A12	FD5	B12	LP
A13	NC	B13	GND
A14	GND	B14	FD13
A15	NC	B15	FD14
A16	NC	B16	GND
A17	FD6	B17	FD15
A18	NC	B18	FD16
A19	FD7	B19	NC
A20	GND	B20	FD17
A21	FD8	B21	NC
A22	NC	B22	ENBKL
A23	FD9	B23	NC
A24	NC	B24	ENVDD
A25	FD10	B25	VCC
A26	NC	B26	VCC



✦ **CF1：（COMPACT FLASH）(ONLY FOR EM-535A)**

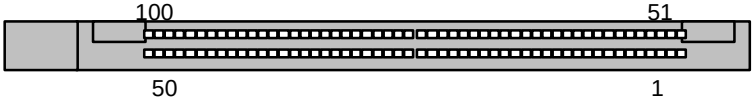
PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	26	CD1-
2	DATA3	27	DATA11
3	DATA4	28	DATA12
4	DATA5	29	DATA13
5	DATA6	30	DATA14
6	DATA7	31	DATA15
7	CE1#	32	CE2#
8	A10	33	VS1
9	OE#	34	IOR#
10	A9	35	IOW#
11	A8	36	WE#
12	A7	37	READY#
13	BVCC	38	BVCC
14	A6	39	NC
15	A5	40	VS2
16	A4	41	RESET
17	A3	42	WAIT#
18	A2	43	INPACK#
19	A1	44	REG#
20	A0	45	BVD2
21	DATA0	46	BVD1
22	DATA1	47	DATA8
23	DATA2	48	DATA9
24	WP	49	DATA10
25	CD2#	50	GND



CF

✦ **PM1：PCMCIA SOCKET(ONLY FOR EM-535A)**

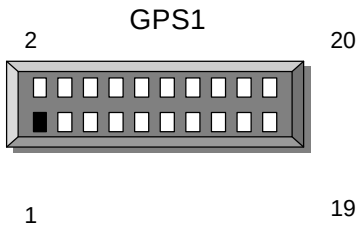
PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	26	GND	51	GND	76	GND
2	DATA3	27	VPP	52	CD1	77	VPP
3	DATA4	28	A16	53	DATA11	78	A22
4	GND	29	GND	54	GND	79	GND
5	DATA5	30	A15	55	DATA12	80	A23
6	DATA6	31	A12	56	DATA13	81	A24
7	GND	32	GND	57	GND	82	GND
8	DATA7	33	A7	58	DATA14	83	A25
9	CE1#	34	A6	59	DATA15	84	VS2
10	GND	35	GND	60	GND	85	GND
11	A10	36	A5	61	CE2#	86	RESET
12	OE	37	A4	62	VS1	87	WAIT#
13	GND	38	GND	63	GND	88	GND
14	A11	39	A3	64	IORD#	89	INPACK#
15	A9	40	A2	65	IOWR#	90	REG
16	GND	41	GND	66	GND	91	GND
17	A8	42	A1	67	A17	92	ABVD2
18	A13	43	A0	68	A18	93	ABVD1
19	GND	44	GND	69	GND	94	GND
20	A14	45	DATA0	70	A19	95	DATA8
21	WE#	46	DATA1	71	A20	96	DATA9
22	GND	47	GND	72	GND	97	GND
23	RDY	48	DATA2	73	A21	98	DATA10
24	VCC	49	WP	74	VCC	99	CD2
25	GND	50	GND	75	GND	100	GND



PCMCIA

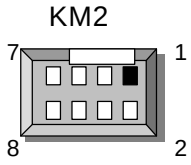
✦ **GPS1：GPS Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	VCC
3	NC	4	NC
5	Reset	6	NC
7	NC	8	NC
9	NC	10	GND
11	SINB（RX）	12	SOUTB（TX）
13	GND	14	NC
15	NC	16	GND
17	GND	18	GND
19	NC	20	NC



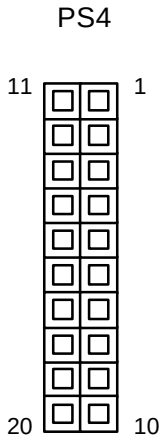
✦ **KM2：KB/Mouse Connector（8 Pin Box Header）**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Keyboard Clock	2	GND
3	NC	4	Keyboard Date
5	NC	6	Mouse Date
7	Mouse Clock	8	VCC



✦ **PS4：ATX Power Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	11	NC
2	NC	12	-12V
3	GND	13	GND
4	VCC	14	Power-ON
5	GND	15	GND
6	VCC	16	GND
7	GND	17	GND
8	Power Good	18	-5V
9	Stand-By 5V	19	VCC
10	+12V	20	VCC



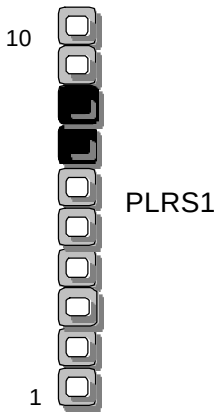
✦ **PLRS1 : Power LED, Reset, Speaker Connector**

PIN NO.	DESCRIPTION
1	Power LED +
2	GND
3	HDD LED +
4	HDD LED -
5	RESET SW +
6	RESET SW – (GND)
7	External Speaker -
8	Internal Buzzer -
9	NC
10	External Speaker +

Default :

7-8 (ON)

Internal Buzzer



CHAPTER 3.

AWARD BIOS SETUP

Award's ROM BIOS provides a built-in Setup program that allows user to modify the basic system configuration and settings. The modified data will be stored in a battery-backed CMOS RAM so that these data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM stay unchanged unless there is configuration change in the system, such as hard drive replacement or new equipment is installed.

3.1 RUNNING AWARD BIOS

The Setup Utility is stored in the BIOS ROM. When the power of the computer system is turned on, a screen message appears to give you an opportunity to call up the Setup Utility; while the BIOS will enter the Power On Self Test (POST) routines. The POST routines perform various diagnostic checks while initializing the board hardware. If the routines encounter an error during the tests, the error will be reported in either of the two different ways, hear a series of short beeps or see an error message on the screen display. There are two kinds of error: fatal or non-fatal. The system can usually continue to boot up sequence with the non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

" Press <F1> to RESUME "

Write down the message and press the F1 key to continue the bootup sequence. After the POST routines are completed, the following message appears:

" Press DEL to enter SETUP "

Entering Setup

Turn on the power of the computer system and press <Del> immediately. If you don't have the chance to respond, reset the system by simultaneously typing the <Ctrl>, <Alt> and <Delete> keys, or by pushing the ' Reset ' button on the system cabinet. You can also restart by turning the system OFF then ON.

3.2 CMOS SETUP UTILITY

To access the AWARD BIOS SETUP program, press the <DEL> key. The screen display will appears as :

Main Program Screen

ROM PCI / ISA BIOS (2A434L7H) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PNP / PCI CONFIGURATION LOAD BIOS DEFAULTS LOAD SETUP DEFAULTS	INTEGRATED PERIPHERALS SUPERVISOR PASSWORD USER PASSWORD IDE HDD AUTO DETECTION SAVE & EXIT SETUP EXIT WITHOUT SAVING
ESC : Quit F10 : Save & Exit Setup	: Select Item (Shift) F2 : Change Color
Time, Date, Hard Disk Type....	

This screen provides access to the utility‘s various functions.

Listed below are explanation of the keys displayed at the bottom of the screen:

<ESC> **:** Exit the utility.

ARROW KEYS **:** Use arrow keys to move cursor to your desired selection.

<F10> **:** Saves all changes made to Setup and exits program.

<Shift><F2> **:** Changes background and foreground colors.

3.3 STANDARD CMOS SETUP

When you select the “STANDARD CMOS SETUP” on the main program, the screen display will appears as :

Standard CMOS Setup Screen

ROM PCI / ISA BIOS (2A434L7H)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm : dd : yy) : Mon,Mar 6 2000
Time (hh : mm : ss) : 14:28:51

HARD DISKS	TYPE	SIZE	CYLS.	HEADS	PRECOMP	LANDZONE	SECTORS	MODE
Primary Master	: Auto	0M	0	0	0	0	0	AUTO
Primary Slave	: Auto	0M	0	0	0	0	0	AUTO
Secondary Master	: Auto	0M	0	0	0	0	0	AUTO
Secondary Slave	: Auto	0M	0	0	0	0	0	AUTO

Drive A : 1.44M, 3.5 in.
Drive B : None
Video : EGA/VGA
Halt On : All ,But Keyboard

Base Memory :	640K
Extended Memory :	61952K
Other Memory :	384K
Total Memory :	62976K

ESC : Quit : Select Item PU / PD / + / - : Modify
F1 : Help (Shift) F2 : Change Color

The Standard CMOS Setup utility is used to configure the following components such as date, time, hard disk drive, floppy drive, display, and memory. Once a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen.

Set Date : Month, Date, Year.

Set Time : Hour, Minute and Second. Use 24 Hour clock format (for p.m. time, add 12 to the hour number, you would enter 4:30p.m. as 16:30)

Hard Disks : There are four hard disks listed: “Primary Master”, “Primary Slave”, “Secondary Master” and “Secondary Slave”. For each IDE channel, the first device is the “Master” and the second device is “Slave”. Hard disk types from 1 to 45 are the standard ones. To select or change the configuration, move the cursor to the desired position and press <Page Up> or <Page Down> to change the option: (1) Press “Auto” for IDE HDD auto detection, (2) Press “User” for user definable, and Press “None” for not installed (e.g. SCSI). There are six categories of information that you must enter for a HDD: “CYLS.” for (number of cylinders), “HEADS” for (number of heads), “PRECOMP” for

(write pre-compensation), “LANDZ” for (landing zone), “SECTOR” for (number of sectors) and ”MODE“ for (Normal, LBA, LARGE and AUTO). The hard disk vendor‘s or system manufacturer’s documentation should provide you with the drive specifications. For an IDE hard drive, you can set “TYPE” to “Auto” or use the “IDE HDD AUTO DETECTION” utility in the main program screen to enter the drive specifications.

The AWARD BIOS supports three HDD modes: NORMAL, LBA and LARGE.

NORMAL mode : This is a Generic Access mode in which neither the BIOS nor the IDE controller will make any transformation during the accession. The maximum HDD size is supported by the NORMAL mode that is 528 Megabytes.

LBA mode : This is a Logical Block Addressing mode which is a HDD accessing method to overcome the 528 Megabytes restriction. The number of cylinders, heads and sectors that are shown in setup may not be the physical number contained in the HDD.

During the HDD accessing, the IDE controller will transform the logical address that is described by the cylinder, head and sector numbers into its own physical address as contained inside the HDD. The maximum HDD size that is supported by the LBA mode is 8.4 Gigabytes.

LARGE mode : Some IDE HDD contains more than 1024 cylinders without the LBA support. This access mode tricks DOS (or other OS) with the number of cylinders that is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT13H in order to access to the right HDD address. The maximum HDD size that is supported by the LARGE mode is 1 Gigabytes.

Note : 1. To support LBA or LARGE mode, there are software located in the AWARD HD Service Routine“INT13H”. It may fail to access a HDD with LBA or LARGE modes selected if you are running under an Operating System that replaces the whole INT13H service routine.

2. Entering incorrect drive specifications will result in a hard disk drive that will function improperly or no function at all.

Floppy Drive A and Floppy Drive B : The options are as follows –

360K, 5.25 in.	720K,3.5in.	2.88M, 3.5in.
1.2M, 5.25in	1.44M, 3.5in.	None (for Not Installed).

Note **:** 1. Not Installed could be used as an option for diskless workstations..
2. Highlight the listing after each drive name and select the appropriate entry.

Video : This category selects the type of video adapter that is used for the primary system monitor. Although secondary monitors are also supported here, you do not have to select the type in the Setup.

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

Halt On : This category determines whether the computer will stop if an error is detected during power up.

No errors	Whenever the BIOS detects a non-fatal error the system will not be stopped and you will be prompted
All errors	The system boot will be stopped for any error that may be detected.
All, But Keyboard	The system boot will not stop for a keyboard error ; it will stop for all Other errors.
All, But Diskette	The system boot will not stop for a disk error ; it will stop for all other Errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error ; it will stop for all other errors.

3.4 BIOS Features Setup

When you select the “BIOS FEATURES SETUP” on the main program, the screen display will appears as:

BIOS Features Setup Screen

ROM PCI / ISA BIOS (2A434L7H)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
		CC000-CFFFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D0000-D3FFF Shadow	: Disabled
Boot Sequence	: A,C,SCSI	D4000-D7FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot Up Floppy Seek	: Disabled	DC000-DFFFF Shadow	: Disabled
Boot Up NumLock Status	: On	Cyrix 6x86/MII CPUID	: Enabled
Boot up System Speed	: High		
Gate A20 Option	: Fast		
Memory Parity Check	: Disabled		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars Sec.)	: 6		
Typematic Delay (M/Sec)	: 250		
Security Option	: Setup		
PCI/VGA Palette Snoop	: Disabled	ESC : Quit	: Select Item
OS Select For DRAM >64MB	: Non-OS/2	F1 : Help	PU /PD /+/ - : Modify
Report No FDD For WIN95	: Yes	F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

The following explains the options for each of the features as listed in the above menu:

Virus Warning : The default setting of the Virus Warning is “Disabled”. When it is enabled, any attempt to write the boot sector and partition table will halt the system and cause a warning message to appear. If this happens, you can use an anti-virus utility on a virus free, bootable floppy diskette to reboot, to clean and to investigate your system.

CPU Internal Cache : The default setting is “Enabled”. This setting enables the CPU internal cache .

Quick Power On Self Test : The default setting is “Enabled”. This speeds up the Power On Self Test (POST) by skipping some items that are normally checked during the full POST. If your system is functioning normally, you can choose this feature to speed the booting process.

Boot Sequence : The default setting is “C:,A:”; the other options are “CDROM, C, A” and “A, C” and “C, CDROM, A”. This setting determines where the computer looks first for an operating system, the hard disk, or the floppy disk, … or other. The BIOS will load the operating system from the disk drives in the sequence as selected here.

Swap Floppy Drive : The default setting is “Disabled”. This setting gives you an option to swap A and B floppy disks. Normally, the floppy drive A is the one at the end of the cable and drive B is at the other end. If you set this option to “Enabled”, the Drive A will function as Drive B, and vice-versa under the DOS.

Boot Up Floppy Seek : The defaults setting is “Disabled”. When enabled, the BIOS will check whether there is a floppy disk drive installed.

Boot Up Numlock Status : The default setting is “On”. If set “Off”, the cursor controls will function on the numeric keypad.

Boot Up System Speed : The default setting is “High”. This sets the CPU speed at boot up.

Gate A20 Option : The default setting is “Fast”. This is the optimal setting for the CPU card. The other option is “Normal”.

Memory Parity Check: Select “Enabled”,”Disabled”,or “Auto”. In Auto mode, the BIOS enabled memory checking automatically when it detects the presence of ECC or parity DRAM.

Typematic Rate Setting : The default setting is “Disabled”. If enabled, you can set the typematic rate and typematic delay.

Typematic Rate (Chars/Sec) : This setting controls the speed at which the system registers the repeated keystrokes. The choices range from 6 to 30 Chars/Sec. The default setting is “6” Chars/Sec.

Typematic Delay (Msec) : This setting controls the time between the display of the first and second characters. There are four delay choices: 250ms, 500ms, 750ms and 1000ms. The default setting is “250” ms.

Security Option : This setting controls the password in the main screen. The options are “Setup” and “System”. Select “Setup” and it will protect the Setup Utility settings
from being tampered with. Select “System” if you want to use password feature every time the system

boots up. The default setting is “Setup”. You can create your password by using the “SUPERVISOR/USER PASSWORD” utility on the main program screen.

PCI/VGA Palette Snoop : The default setting is “Disabled”. Set to “Enable” if any ISA adapter card installed requires VGA palette snooping.

OS Select For DRAM > 64MB : The default setting is “Non-OS2”. Set to “OS2” if the system memory size is greater than 64MB and the operating system is OS/2.

Report No FDD For WIN 95 : Select “Yes” to release IRQ6 when the system contains no floppy drive , for compatibility with Windows 95 logo certification. In the Integrated Peripherals screen select “Disabled” for the Onboard FDC Controller field.

Video BIOS Shadow : The default setting is “Enabled” which will copy the VGA display card BIOS into system DRAM to improve performance.

C8000-CBFFF Shadow to DC000-DFFFF Shadow : The default setting for the shadow feature is “Disabled”. When enabled, the ROM with the specific address is copied into system DRAM. It will also reduce the size of memory available to the system. After you have made your selection in the BIOS FEATURES SETUP, press the <ESC> key to go back to the main program screen.

3.5 CHIPSET FEATURES SETUP

When you select the “CHIPSET FEATURES SETUP” on the main program, the screen display will appears as:

Chipset Features Setup Screen

ROM PCI / ISA BIOS (2A434L7H)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

SDRAM CAS latency Time	: 3T	Flat Panel Status	: Disabled
SDRAM Clock Ratio Div By	: 4	Flat Panel Resolution	: 640x480
16-bit I/O Recovery (CLK)	: 5		
8-bit I/O Recovery (CLK)	: 5		
USB Controller	: Disabled		
Build in CPU Audio	: Enabled		
Audio I/O Base Address	: 220H		
MPU-401 I/O Base Address	: 330H		
Audio IRQ Select	: IRQ5		
Audio Low DMA Select	: DMA 1	ESC : Quit	: Select Item
Audio High DMA Select	: DMA 5	F1 : Help	PU /PD /+/ - : Modify
		F5 : Old Values	(Shift) F2 : Color
Multiple Monitor Support	: PCI First	F6 : Load BIOS Defaults	
Video Memory Size	: 2.5M	F7 : Load Setup Defaults	

This screen controls the settings for the board‘s chipset. All the entries on the screen are automatically configured. However, you can change it according to your operating environment.

SDRAM CAS Latency Time: When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

16-bit/8-bit I/O Recovery (CLK) : The I/O recovery mechanism adds bus clokc cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus. These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

USB Controller: Select Enabled if your system contains a Universal Serial Bus(USB) controller and you have USB peripherals

Audio I/O Base Address: Select a base I/O address for the audio port

MPU-401 I/O Base Address: Select a base I/O address for the MPU-401 interface

Audio IRQ Select: Select an interrupt for the audio port

Audio DMA Select: Select a DMA channel for the audio port

After you have made your selections in the CHIPSET FEATURES SETUP, press the <ESC> key to go back to the main program screen.

3.6 POWER MANAGEMENT SETUP

The "Power Management Setup" controls the CPU card's "Green" features. When you select the "POWER MANAGEMENT SETUP" on the main program, the screen display will appears as:

Power Management Setup Screen

ROM PCI / ISA BIOS (2A434L7H)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	: Disabled	IRQ1	(Keyboard)	: ON
		IRQ3	(COM 2)	: OFF
** PM Timers **		IRQ4	(COM1)	: OFF
Doze Mode	: Disabled	IRQ5	(LPT 2)	: OFF
Standby Mode	: Disabled	IRQ6	(Floppy Disk)	: OFF
HDD Power Down	: Disabled	IRQ7	(LPT 1)	: OFF
MODEM Use IRQ	: NA	IRQ9	(IRQ2 Redir)	: OFF
		IRQ10	(Reserved)	: OFF
		IRQ11	(Reserved)	: OFF
		IRQ12	(PS /2 Mouse)	: OFF
Throttle Duty Cycle	: 33.3%	IRQ13	(Coprocessor)	: OFF
		IRQ14	(Hard Disk)	: OFF
		IRQ15	(Reserved)	: OFF

ESC	: Quit		: Select Item
F1	: Help	PU /PD/+/-	: Modify
F5	: Old Values	(Shift) F2	: Color
F6	: Load BIOS Defaults		
F7	: Load Setup Defaults		

Power Management : This setting controls the System Doze Mode, Standby Mode and Suspend Mode Timer features. There are four options namely --

User Define **:** Allows you to customize all power saving timer features.
Optimize **:** This is the recommended setting for general use.
Test/Demo **:** This is for test/demonstration purpose.
Disable **:** Disable the power management features.

Doze Mode: Options are from “1 Min” to “1 Hour” and “Disable”. The system speed will change from turbo to slow and the video signal will be suspended, if no Power Management events occur for a specified length of time. Full power function will return when a Wake-Up event is detected.

Standby Mode : Options are from “1 Min” to “1 Hour” and “Disable”. The system speed will change from turbo to slow and the video signal will be suspended, if no Power Management events occur for a specified length of time. Full power function will return when a Wake-Up event is detected.

HDD Power Down : Options are from “1 Min.” to “15 Min.” and “Disable”. The IDE hard drive will spin down if it is not accessed within a specified length of time.

MODEM Use IRQ : This field name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

Throttle Duty Cycle: When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

IRQ1~IRQ15 : These fields are designed for selected peripherals, e.g. Keyboard, COM2, COM1, LPT2, Floppy Drive, etc… You can set to either “ON” or “OFF” fields to activate or deactivate these peripherals.

After you have made your selection in the POWER MANAGEMENT SETUP, press the <ESC> key to go back to the main program screen.

3.7 PnP/PCI Configuration

Both the ISA and PCI buses on the CPU card use system IRQs & DMAs. You must set up the IRQ and DMA assignments correctly through the PnP/PCI Configuration Setup utility, otherwise the SBC will not work properly.

When you select the "PnP /PCI CONFIGURATION" on the main program, the screen display will appears as:

PnP/PCI Configuration Setup Screen

ROM PCI / ISA BIOS (2A434L7H)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

PNP OS Installed		: No		PCI IRQ Activated By	: Level
Resources Controlled By		: Manual			
Reset Configuration Data		: Disabled			
				Used MEM base addr	: N/A
IRQ-3	Assigned to	: Legacy	ISA		
IRQ-4	Assigned to	: Legacy	ISA		
IRQ-5	Assigned to	: PCI/ISA	PnP		
IRQ-7	Assigned to	: Legacy	ISA		
IRQ-9	assigned to	: PCI/ISA	PnP		
IRQ-10	assigned to	: PCI/ISA	PnP		
IRQ-11	assigned to	: PCI/ISA	PnP		
IRQ-12	assigned to	: PCI/ISA	PnP		
IRQ-14	assigned to	: PCI/ISA	PnP		
IRQ-15	assigned to	: PCI/ISA	PnP		
DMA-0	assigned to	: PCI/ISA	PnP		
DMA-1	assigned to	: PCI/ISA	PnP		
DMA-3	assigned to	: PCI/ISA	PnP	ESC : Quit	: Select Item
DMA-5	assigned to	: PCI/ISA	PnP	F1 : Help PU /PD/+/-	: Modify
DMA-6	assigned to	: PCI/ISA	PnP	F5 : Old Values (Shift) F2	: Color
DMA-7	assigned to	: PCI/ISA	PnP	F6 : Load BIOS Defaults	
				F7 : Load Setup Defaults	

PNP OS Installed : Select Yes if the system operating environment is Plug-and-Play aware .

Resources Controlled By : The defaults setting is "Auto" which will control all IRQs and DMAs automatically. The other option is "Manual" which allows you to control IRQs and DMAs individually.
Reset Configuration Data : The default setting is "Disabled". When set to "Enabled", the content of the ESCD block in flash BIOS will be cleared.

IRQ assigned to and DMA assigned to : If there is a legacy ISA device which uses an IRQ or a DMA,

set the corresponding IRQ or DMA to " Legacy ISA"; otherwise you should set to PCI/ISA PnP.

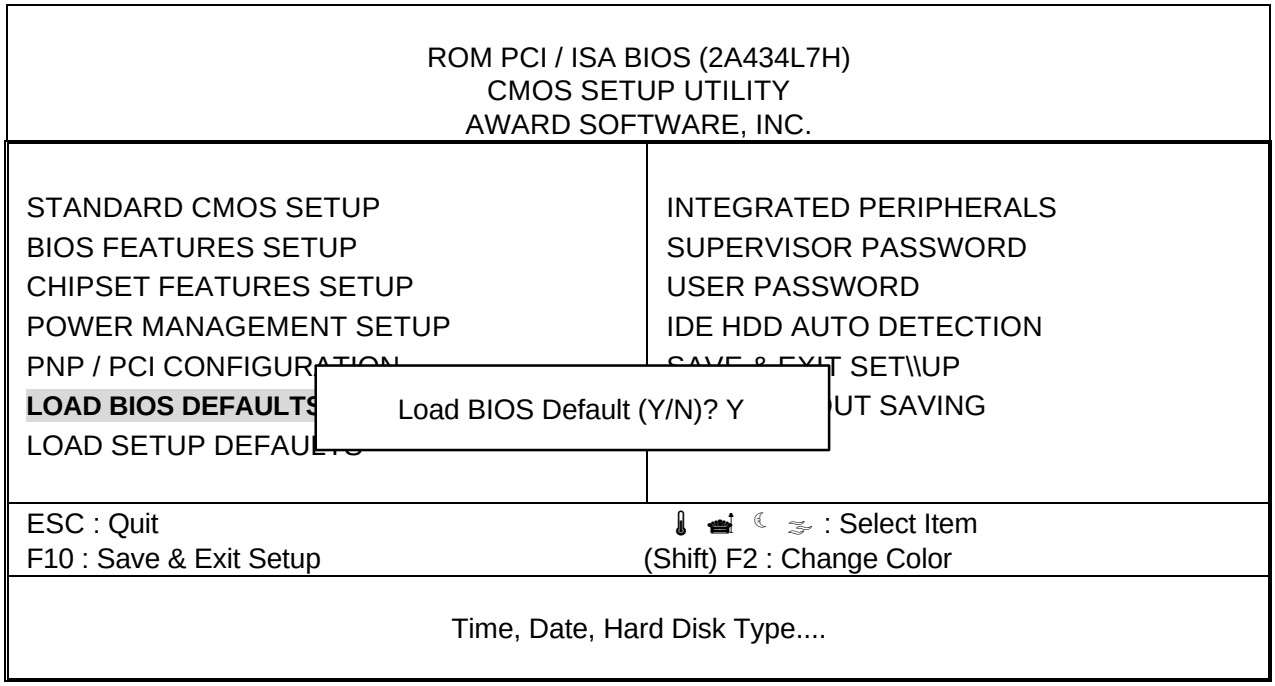
PCI IRQ Activated By : Options are "Level" or "Edge". The default setting is "Level", this option is used to select the IRQ's trigger method.

Used MEM base addr : Because BIOSes fail to auto detect some specific ISA Legacy cards with requested memory space below 1M address, we have added the "Used MEM base addr" and "Used MEM Length" to support such kind of cards. Now, with these two functions, users can define where the used memory address is located and its length of the legacy area correspondingly. Based on this, BIOS will skip the UMB area that is used by the legacy device to avoid the memory space conflict. For example, if the user select "D000" for "Used MEM base addr" and "16K" for "Used MEM Length" that means the address region D0000H-D3FFFH is occupied by ISA legacy cards, and BIOS will not assign this region for PnP/ISA and PCI cards.

3.8 LOAD BIOS DEFAULTS

The BIOS defaults have been set by the manufacturer which represent settings provided with the minimum requirements for your system to operate. " **Load BIOS Defaults** " loads the troubleshooting default values permanently recorded in the BIOS ROM. These settings are non-optimal and turn off all high performance features.

The Standard CMOS Setup screen is not affected. To use this feature, highlight it on the main screen and press <Enter>. A line will appear asking if you want to load the BIOS default values. Press the <Y> key and the <Enter>. The default settings will load. Press <N> if you do not want to proceed.



3.9 LOAD SETUP DEFAULTS

"LOAD SETUP DEFAULTS" loads the optimal settings which are stored in BIOS ROM. The defaults loaded affect only the BIOS Features Setup, Chipset Features Setup, Power Management Setup, PnP/PCI configuration setup and Integrated Peripherals Setup. There is no effect on the Standard CMOS Setup. To use this feature, highlight the entry on the main screen and press <Enter>. A line will appear on the screen asking if you want to load the Setup default values. Press the <Y> key and then press the <Enter> key if you want to load the Setup defaults. Press <N> if you do not want to proceed.

3.10 INTEGRATED PERIPHERALS

When you select the "INTEGRATED PERIPHERIALS" on the main program, the screen display will appears as:

Integrated Peripheral Setup Screen

ROM PCI / ISA BIOS (2A434L7H)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

IDE HDD Block Mode	: Enabled	Onboard Parallel Port	: 378/IRQ7
Primary IDE Channel	: Enabled	Parallel Port Mode	: SPP
Master Drive PIO Mode	: Auto		
Slave Drive PIO Mode	: Auto	Onboard Serial Port 3	:3E8H
Secondary IDE Channel	: Enabled	Serial Port 3Use IRQ	:IRQ10
Master Drive PIO Mode	: Auto	Onboard Serial Port 4	:2E8H
Slave Drive PIO Mode	: Auto	Serial Port 4 Use IRQ	:IRQ3
		Onboard Parallel Port 2	:278H
IDE Primary Master UDMA	: Auto	Parallel Port 2 Use IRQ	:IRQ11
IDE Primary Slave UDMA	: Auto		
IDE Secondary Master UDMA	: Auto		
IDE Secondary Slave UDMA	: Auto		
KBC input clock	: 8MHz		
Onboard FDC Controller	: Enabled		
Onboard Serial Port 1	: 3F8/IRQ4		
Onboard Serial Port 2	: 2F8/IRQ3		
Onboard IR Controller	: Disabled		

ESC	: Quit		: Select Item
F1	: Help	PU /PD/+/-	: Modify
F5	: Old Values	(Shift) F2	: Color
F6	: Load BIOS Defaults		
F7	: Load Setup Defaults		

IDE HDD Block Mode : The Default setting is "Enabled". This feature enhances the hard disk performance by making multi-sector transfers instead of one sector per transfer. Most IDE drives, except the very early design, have Block Mode transfer feature.

Primary IDE Channel : Select "Enabled" to activate the on-chip IDE interface.

Master Drive PIO and Slave Drive PIO : There are six options namely "Auto", "Mode 0", "Mode 1","Mode 2", "Mode 3" and "Mode 4". The default setting is "Auto". When it is set to "Auto", the BIOS will automatically set the mode to match the transfer rate of hard disk. If the system won't boot up when set to "Auto", set it manually to the lower mode (e.g. From Mode 3 to Mode 2). All IDE drives

should work with PIO mode 0.

IDE Primary Master UDMA,IDE Primary Slave UDMA: Ultra DMA /33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver(Window 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support.

Onboard FDC Controller : Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.

Onboard Serial Port 1 / 2 : These options are used to assign the I/O addresses for the two on-board serial ports. They can be assigned as follows:

Auto **[Default]**
3F8 / IRQ4
2F8 / IRQ3
3E8 / IRQ4
2E8 / IRQ3
Disabled (Disable the onboard serial port)

Onboard Parallel Port : This option is used to assign the I/O address for the onboard parallel port. The options are “378/IRQ7” (defaults), “278/IRQ7”, “3BC/IRQ7” and “Disabled” (disable the onboard parallel port). Note: Printer port always use IRQ7 when set to “378/IRQ7” or “278/IRQ7”, or from “3BE/IRQ7” to “Enabled”.

Parallel Port Mode: There are four options “Normal” (default), “ECP”, “ECP/EPP” and “EPP/SPP”. Change the mode from “Normal” to the enhanced mode only if your peripheral device can support it. When it is set to ECP mode, the printer port always uses DMA3.

3.11 SUPERVISOR/USER PASSWORD

The “SUPERVISOR/USER PASSWORD” utility sets the password. The SBC is shipped with the password disabled. If you want to change the password, you must first enter the current password, then at the prompt -- enter your new password. The password is case sensitive, and can be up to 8 alphanumeric characters. Press <Enter> after you have finished typing in the password. At the next prompt, confirm the new password by re-typing it and pressing <Enter> again. When you are done, the screen automatically reverts to the main screen. Remember that when you use this feature, the “Security Option” line in BIOS FEATURES SETUP will determine when entering the password will be required.

To disable the password, press the <Enter> key instead of entering a new password when the “Enter Password” in the dialog box appears. A message will appear confirming that the password is disabled.

If you have set both supervisor and user password, only the supervisor password allows you to enter the BIOS SETUP PROGRAM.

Note : If you forget your password, the only way to solve this problem is to discharge the CMOS memory by turning power off and placing a shunt on the S1 (open pad) for 5 seconds, then removing the shunt.

3.12 IDE HDD AUTO DETECTION

If your system has an IDE hard drive, you can use this utility to detect its parameters and enter them into the Standard CMOS Setup automatically.

If the auto-detected parameters displayed do not match the ones that should used for your hard drive, do not accept them. Press the <N> key to reject the values and enter the correct ones manually on the Standard CMOS Setup screen.

Note : If you are setting up a new hard disk drive (nothing on it) that supports LBA mode, more than one line will appear in the parameter box, choose the line that lists LBA for an LBA drive.

Do not choose Large or Normal if the hard disk drive is already fully formatted when you install it, choose the mode “HDD Low Level Format” to format it.

3.13 SAVE & EXIT SETUP

Select this option and press the <Enter> key to save the new setting information in the CMOS memory

and continue with the booting process.

3.14 Exit Without Saving

Select this option and press the <Enter > key to exit the Setup Utility without recording any new values or changing old ones

CHAPTER 4.

BIOS UPDATED

Manufacture default BIOS supports both VGA and LCD(FEM-535A.BIN).If you want to use TV or RGB terminals, please change BIOS as following:

4.1 BIOS LIST(DIRECTORY CD\EM-535\BIOS)

BIOS NAME	FUNCTION
FEM-535A.BIN	LCD
FEM-535B.BIN	TV
FEM-535C.BIN	RGB

4.2 AWARD BIOS FLASH INSTRUCTIONS

It is important to have the system boot cleanly before executing a flash BIOS upgrade since it should not be run under any protected mode environments. (make sure that EMM386.EXE is not being loaded in your config.sys file)

If you have a Windows 95 startup diskette, make a copy of it. Use this new copy to flash the BIOS. Proceed to step (4).

If you do not have a Windows 95 startup diskette, here are the instructions to make one:

- Insert a blank floppy in the A: drive.
  1. Go to Add/Remove Programs in the Control Panel.
  2. Click on the Start Menu and highlight Settings.
  3. From the next menu click on Control Panel.
  4. Click on Add/Remove Programs.
     (1) Select the Startup Disk tab at the top of the screen.
     (2) Place a blank formatted diskette in the A:\drive.
     (3) Click on Create Disk.
     (4) Copy awardflash.exe
     (5) Copy bios file.*bin form driver CD-ROM into diskette.

How to create a startup disk from DOS:
Insert a blank floppy in the A: drive.
Type "Format a: /s"

- Reboot your system with the bootable floppy disk in your A: drive.(You might have to change the boot up sequence (in BIOS setup) from C:A: to A:C: before reboot.)

- Confirm the BIOS filename on the diskette matches the name on the manual.
  To confirm the bios filename do a directory command on the A: drive (DIR A: /W

<return>) You should see a filename that matches the name on the disk label.
(ex: filename fem-535a.BIN)

- Make a note of the filename with the .BIN extension.

- Run the Award flash program AWARDFLASH.EXE
  - Type “awardflash xxxxxxxx.bin /cc/sn/cp”
    Ex: you want change to FEM-535B.BIN,”awardflash FEM-535B.bin)

- Follow the on screen instructions and it will ask for the name of theBIOS file (filename.bin)to program.Enter the entire filename and press Enter.The program will ask you to confirm that you want to program the bios. press Enter.

Make sure when it is programming that you do not turn off or reset thecomputer or else your bios will be damaged. You should see a progres sbar and the lower half of the screen and then it will prompt you to reset.

- You should be able to see new BIOS version display on the screen when you reboot your system. Press <del> and setup your bios again.

CHAPTER 5.

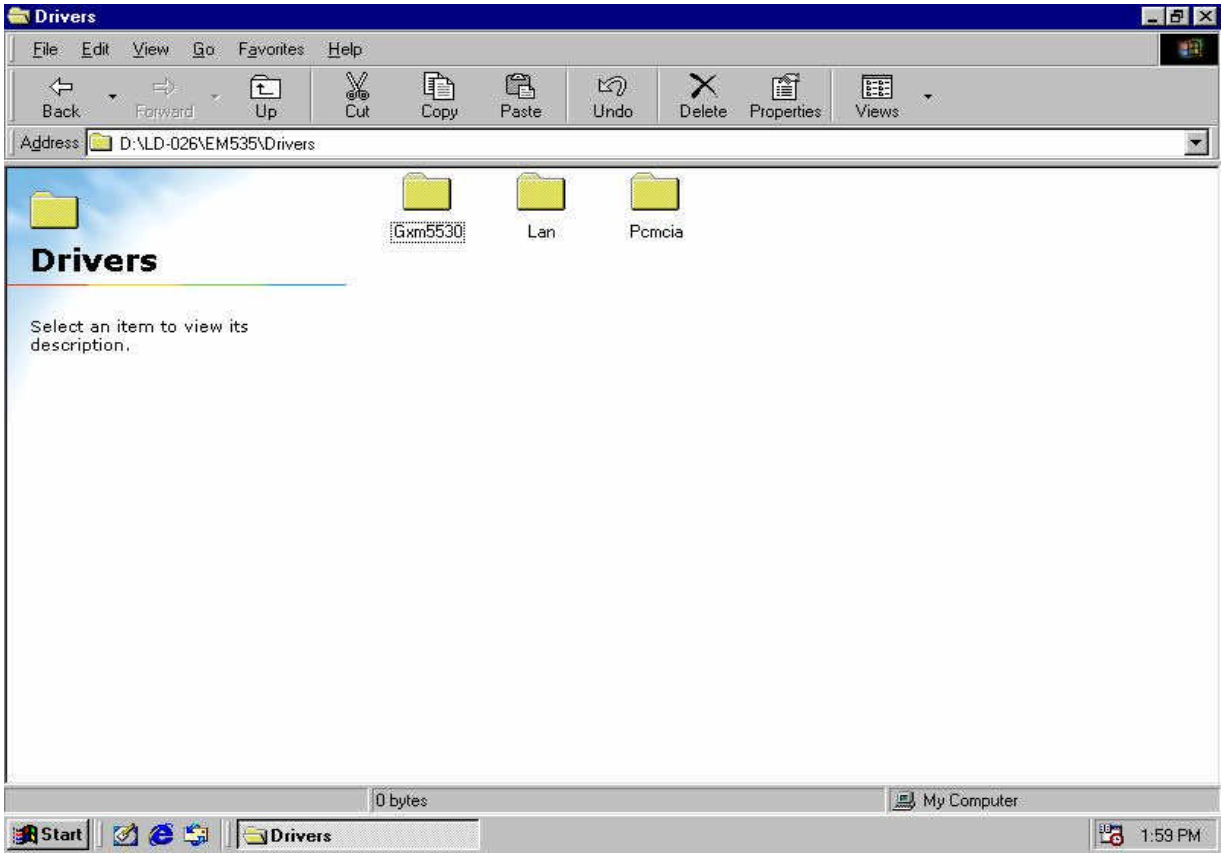
DRIVERS SUPPORT

5.1 USE YOUR DRIVER CD-ROM

This chapter provides information on how to install the drivers that come in the CD-ROM with the package. Please follow the instructions set forth in chapter carefully.

1. Find the directory for your O/S accordingly.
2. Always read the README.TXT. before installation.
3. Run the *.EXE., and follow the installation prompt step by step.

5.2 FILE DIRECTORY



APPENDIX A.

HOW TO USE WATCH-DOG TIMER

To use the watch-dog timer :

Step 1. Enable and retrigger the Watch-Dog timer: **443H**

Step 2. Disable: **O441**

EX.1: For DOS

Execute the **DEBUG.EXE** file under DOS, Then key-in **O443**. The system will reboot automatically according to the time-out you set.

Enable	**Disable**
C:\DOS> DEBUG	C:\DOS> DEBUG
O 443 0~F	O 441 0~F

EX.2: For assemble Language

Enable :

```
:
:
MOV    DX, 443H
IN AL, DX
:
:
```

Disable :

```
:
:
IN AL, 441H
:
:
```

APPENDIX B

TECHNICAL REFERENCE

I/O PORT ADDRESS MAP

Address	Function
000 - 01F	DMA Controller #1
020 - 03F	Interrupt Controller #1
040 - 05F	Timer Chip
043	Disable Watch-Dog Times Operation (Read)
060 - 06F	Keyboard Controller
070 - 07F	Read Time Clock/NMI Mask
080 - 09F	DMA Page Register
0A0 - 0BF	Interrupt Controller #2
0C0 - 0DF	DMA Controller #2
0F0 - 0F1	Clear/Reset Math Coprocessor
1F0 - 1F7	Hard Disk Controller
200 - 210	Game Port
278 - 27F	Parallel Port #2
2E8 - 2EF	Serial Port #4 (COM 4)
2F8 - 2FF	Serial Port #2 (COM 2)
300 - 31F	prototype Card/Streaming Tape Adapter
360 - 36F	PC Network
378 - 3FF	Parallel Port #1
380 - 38F	SDLC #2
3A0 - 3AF	SDLC #1
3B0 - 3BF	MDA Video Card (Including LPTO)
3C0 - 3CF	EGA Card
3D0 - 3DF	CGA Card
3E8 - 3EF	Serial Port #3 (COM 3)
3F0 - 3F7	Floppy Disk Controller
3F8 - 3FF	Serial Port #1 (COM 1)
443	Enable Watch-dog Timer Operation (read)

MEMORY ADDRESS MAP

Address Range (Hex)	Description
000000H - 09FFFFH	640 KB of Conventional RAM
0A0000H - 0BFFFFH	128 KB of Video RAM
0C0000H - 0EFFFFH	256 KB of I/O Expansion ROM
0F0000H - 0FFFFFH	64 KB of System BIOS ROM
0100000H - 7FFFFFFFH	1 MB ~ 128MB of User RAM

DMA CHANNELS

CHANNEL	Function
DMA 0	Reserved
DMA 1	Reserved
DMA 2	Floppy Disk Controller
DMA 3	ECP Parallel Port
DMA 4	Cascade for DMA #1
DMA 5	Reserved
DMA 6	Reserved
DMA 7	Reserved

INTERRUPT CONTROLLER

IRQ	Function
IRQ 0	System timer output
IRQ 1	Keyboard
IRQ 2	Cascade for INTC #2
IRQ 3	Serial port #2
IRQ 4	Serial port #1
IRQ 5	Parallel port #2
IRQ 6	Floppy disk controller
IRQ 7	Parallel port #1
IRQ 8	Real time clock
IRQ 9	Software redirected to INT 0AH (IRQ 2)
IRQ 10	Reserved
IRQ 11	Reserved
IRQ 12	PS/2 Mouse
IRQ 13	Math Coprocessor (CPU Internal)
IRQ 14	Primary Hard disk
IRQ 15	Secondary Hard Disk
NMI	Parity Check Error

GLOSSARY

8-Bit Bus – Data is transmitted to expansion slots and other components on the bus only along 8 parallel data line.

10Base-T – It is a 10Mbps IEEE 802.3/Ethernet standard that uses unshielded twisted pair cable specification. 10Base-T supports network configuration using the CSMA/CD access method over a twisted pair transmission system up to 100 meters in length without the use of repeater.

16-Bit Bus or ISA Bus – Data is transmitted along either 8 or 16 data lines, depending on what kind of adapter card is used in an expansion slot. ISA is the abbreviation of Industry Standard Architecture.

100Base-TX – It is a 100Mbps IEEE 802.3/Ethernet standard that uses UTP cable. Also called Fast Ethernet, it uses RJ-45 connectors and EIA/TIA T568B pinning. Maximum cable length from hub to node is 100 meters without a repeater.

Adapter – It is also called an expansion board, expansion card, or adapter card. It is a small circuit board that is installed in the expansion slots on the motherboard. You can install a particular adapter that connects a new device such as internal modem, sound card, and scanner.

AGP (Accelerated Graphic Port) – is a 32-bit, 66MHz data bus that transmit a maximum of 528MB of data.

bps – Bits per second. Also often preceded by K (kilo/thousands), **Kbps** – Kilo bytes per second, and M (mega/million), **Mbps** – Mega bytes per second.

BIOS (Basic Input /Output System) – This is a chip on the motherboard that contains the instructions for starting up, or booting, the computer, and more.

Bus – Data that travels in a computer along the circuits on the motherboard are called buses. Although three main buses (data bus, address bus, and control bus) manage the computer's operation, often these are collectively called the bus. The bus carries instructions back and forth between the CPU and other devices in the system. ISA,

EISA, VL-Bus, PCI and SCSI are examples of PC buses.

Bus Mastering – A method of transferring data through a bus in which the device takes over the bus and directly controls the transfer of data to the computer's memory. Bus mastering is a method of Direct Memory Access (**DMA**) transfer.

Cache – Cache RAM is an extra holding area for program instructions that need to be frequently used by the CPU or swapped in and out of RAM. Your CPU can usually access those instructions from the cache more quickly than it could from a hard disk or even RAM, so a cache helps the system work more efficiently. Most systems sold today offer either 256K or 512K cache.

CPU (Central Processing Unit) – executes all commands and controls the flow of data, providing the " brain " that enables the PC to calculate and perform the operations like sorting information more quickly than a human is able to. The CPU makes perhaps the greatest contribution to a PC's speed and power. Note: Any additional information is subject to change without prior revision from the supplier.

Table 1 -- CPU Speeds

Processor type	Speed ratings (MHz)
486DX2	66, 80
486DX2	75, 100, 120
Pentium	90, 100, 120, 133, 166, 200, 233
Pentium MMX	166, 200, 233, 266
Pentium Pro	166, 180, 200
Pentium II	233, 266, 300

EIDE (Enhanced IDE) – It is a hard drive controller that enables your system to be able to handle fast hard disk drives at a speed of 10Mbps.

EISA or MCA Bus – Data is transmitted along 32 data lines to adapter cards designed specifically to work with the 32-bit buses. MCA expansion slots cannot accept 8-bit or 16-bit adapter cards. EISA stands for Extended Industry Standard Architecture, while MCA stands for MicroChannel Architecture. MCA is architecture used in IBM Microcomputer.

Expansion slots – Expansion slots are plug-in connectors that allow you to insert additional circuit boards that attach to the rest of the PC through special circuitry called the **bus**. By inserting the right circuit board -- usually called an **adapter** or an **expansion card** – you can increase the resolution and the number of colors used by the display, or you can transform your PC into a machine for recording and playing music.

Fast SCSI – The common nomenclature associated with SCSI-2, the second generation of SCSI offering mandatory parity checking improvements over SCSI-1.

IDE (Integrated Drive Electronics) – It was developed from ST-506 type hard drive interface, utilizing BIOS INT 13h hard drive with secondary software and supports two hard drives (Master and Slave). This device does not need extra software to run it since it is directly initiated in the BIOS. Data transfer rate is 4.1 Mbps. Take note that this interface cannot support other drives like a CD-ROM drive.

IEEE (Institute of Electrical and Electronic Engineers) – It is an international professional society that issues its own standard, and is a member of ANSI and ISO. Popular known standards is:

IEEE802.3	–	is a physical layer standard for 10Base-T, 100Base-T, Ethernet, and StarLAN.
IEEE802.5	–	is a physical layer standard for Token Ring.
IEEE802.11	–	is a physical layer standard for Wireless LAN/WAN compatibility.
IEEE802.12	–	is a physical layer standard for 100VG AnyLAN.

LAN (Local Area Network) – A data communications network spanning a limited area. It provides communications between three or more computers and peripherals, in most cases using a high-speed media as its backbone.

Keyboard – This is a component that comes in direct contact for you with your PC. The mechanism of keyboard converts a key cap's movement into a signal sent to the computer. The most common key mechanisms are " **capacitate** " and " **hard contact** ". Capacitate keyboard has a spring that causes the plastic and the metal plunger to move nearer to two pads that have large plates (plated in tin, nickel, and copper). These pads are connected to the keyboard's printed circuit board. Hard contact keyboard causes the key cap to collapse a foam rubber dome that presses against a sheet of plastic on the bottom of which is metallic area connected to the rest of the keyboard's circuit board.

LDCM (LANDesk Client Manager) – With the help of LDCM, PCs that are either stand-alone or on a network can not escape the control of a system administrator. Alerts will be sent to the user if an abnormal condition is encountered in a PC. It allows the administrator to give each PC a thorough check-up. Additionally, this feature is available to multiple OS's on the market today. LDCM Key Features include the following : Health Monitoring, Real-Time Alerting, Remote Accessibility, Extensive Instrumentation. This is a product from Intel.

Mouse – The keyboard is a barrier to learn how to use a computer. Xerox Corporation first developed the concept of a pointing device, something a computer user could move with his or her hand, causing a corresponding move on screen. Because of its size and tail like cable, the device was named for the mouse. Apple Computer made the mouse a standard feature of its Macintosh computers, and with the popularity of Windows, a mouse is becoming standard equipment on all PCs, as well. " **Trackballs** " have survived more awkward methods of navigating with the keyboard. " **Digitizing tablets** " are popular with architects and engineers who must translate precise movements of a pen into lines on the screen. " Touch screens ", on which you press either your finger and a special light pen to control the software, are too tiring to use for any length of time.

MMX – – CPU's with MMX technology are optimized to run multimedia applications, and therefore, offer faster multimedia playback than standard CPUs. However, when manufacturers introduce any new hardware technology the software makers need to catch up. At this time of compilation most applications cannot yet take advantage of MMX capabilities.

Parallel port – Parallel ports (labeled **LPT1**, **LPT2**, and so on) are usually for plugging in printers. It is also often called a **Centronics port** – has been almost synonymous with **printer port**. Although a serial port can also be used to send data from a PC to some models of printers, the parallel port is faster. A serial port sends data one bit at a time over a single one-way wire; a parallel port can send several bits of data across eight parallel wires simultaneously. Take note that a serial connection sends a single bit, a parallel port send an entire byte.

PCI Bus (Peripheral Component Interconnect) – It is a connection slot in a motherboard that supports 32-bit bus transfer rates. The now standard PCI Local Bus
carries data along at least 32 lines, that is, at least 32 bits at a time. Local bus computer designs add special buses so the CPU can communicate directly with key components like the monitor, resulting in

much better performance. You should look for PCI local bus capabilities in any system you buy, especially PCI local bus video (which helps the monitor display more quickly).

POST (Power-On Self-Test) – is the first thing your PC does when you turn it on, and it's your first warning of trouble with any of the components. When the POST detects an error from the display, memory, keyboard, or other basic components, it produces a warning error in the form of a message on your display and — in case your display is part of the problem — in the form of a series of beeps.

RAM (Random Access Memory) – consists of a bank of chips that act as " working memory ", holding program instructions and data only while your computer is turned on. Unless the instructions and data are saved to a disk, RAM forgets them when you turn your computer off. RAM is measured in megabytes (M). Most computers today come with 32M of RAM, though some sell with only 16M installed. There are a few different flavors and speeds of RAM, as well. One of the most prominent today is Extended Data Output (EDO) RAM, but an even faster type of RAM that has just hit the market is called **SyncDRAM**.

Serial port – Serial ports are also sometimes called **COM** (short for COMmunications) ports, and are labeled **COM1**, **COM2**, and so on. It is simple in concept: one line to send data, another line to receive data, and a few other lines to regulate how data is sent over the other two lines – from commonplace modems and printers to plotters and burglar alarms. The most common use for serial port is with a **mouse** or **modem**. The reason for this is that a serial port is not a very efficient way to transfer data, so little data that speed is not crucial, and perfect for modems because with current technology, phone lines cannot transport more than one signal at a time anyway. The **serial port** is often referred to as an **RS-232 port**.

SCSI (Small Computer System Interface) – An intelligent bus for transmitting data commands between a variety of devices. There are many implementations of SCSI, including Fast SCSI, Wide SCSI, Fast Wide SCSI, Fast-20, and Fast-40.

SCSI-2 – The second generation of SCSI; includes many improvements to SCSI-1, including Fast SCSI, Wide SCSI, and mandatory parity checking.

SCSI-3 – The third generation of SCSI; introduces Fast-20 and Fast-40 as improvements to the parallel bus. The standard also includes a number of specifications for high-speed serial bus architectures such as SSA, Fiber Channel, and IEEE 1394. Also known as

Ultra SCSI.

Ultra SCSI – Also known as SCSI-3, is a third generation SCSI standard that introduced parallel bus speed improvements (FAST-20 and FAST-40), an the miniaturized 68-pin micro connector.

USB (Universal Serial Bus) – USB consolidates serial, parallel, keyboard, mouse, and game ports into one asynchronous and isochronous communications port with bandwidth for data transfer speeds up to 12 Mbps without termination. By daisy-chaining USB hubs, up to 127 I/O devices can be connected to one USB port on the PC. USB is completely plug-and play meaning peripherals can be correctly detected and configured automatically as soon as they are connected.

UTP (Unshielded Twisted Pair) – Twisted pair cable with neither individual nor overall shielding. **Twisted Pair** are two wires twisted together to reduce susceptibility to RF crosswalk.

VGA (Video Graphics Array) – A video adapter that supports 640x480 pixels color resolution. The Windows OS provides medium text & graphics standard.

VL-Bus – It is also known as Local Bus; this is an I/O interface that is directly connected and depended of the system CPU. The VL-Bus is an abbreviation of VESA Local Bus.

Terms and Conditions

Date:1997.10.20

Warranty Policy

1. All products are warranted against defects in materials and workmanship on a period of two years from the date of purchase by the customer.
2. The buyer will bear the return freight charges for goods that are returned for repair within the warranty period whereas manufacturer will bear the other way after repair.
3. The buyer will pay for repair (for the replaced materials plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service ", RMA goods will be returned at the customer expense.
5. The following conditions are excluded from this warranty :
   A. Improper or inadequate maintenance by the customer.
   B. Unauthorized modification or misuse.
   C. Operation outside of the environmental specifications for the product.

RMA Service

1. Request a RMA# :

Complete and fax to Supplier the "RMA Request Form" to obtain a RMA number.

2. Shipping:

A. The customer is requested to fill up the problem code as listed . If none of the code is selected, please write the symptom description on the remark.

B. Ship the defective units with freight prepaid.

C. Mark the RMA # clearly on the box.

D. Shipping damage as a result of inadequate packing is the customer's responsibility.

E. Use the original packing materials whenever possible .

3. All RMA# are valid for 30 days only:

When RMA goods are received after valid RMA# period , the goods will be rejected.

RMA Service Request Form

Date:1997.10.20

When requesting RMA service, please fill out this "RMA Service Request Form". This form needs to be shipped with your returns. Service cannot begin until we have this information.

Company:	Person to contact:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address _____	
_____	

***For Supplier only**

RMA No:

Account Sales:

Model No.	Serial No.	Problem Code	Remark
			*This form could be copied for more description

***Problem Code**:

01:D.O.A.
02: Second Time R.M.A.
03: No Screen
04: CMOS Data Lost
05: FDC Fail
06: HDC Fail
07: Bad Slot
08: BIOS Problem
09: Keyboard Controller Fail
10: Cache RMA Problem
11: Memory Socket Bad
12: Hang Up Hardware
13: Hang Up Software
14: Other (Pls. Specify)

Request Party ***Confirmed By Supplier***

Authorized Signatures

Authorized Signatures